Dec. 26, 1939. C. H. MENGE 2,185,036

SEAT

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Fig. 1.

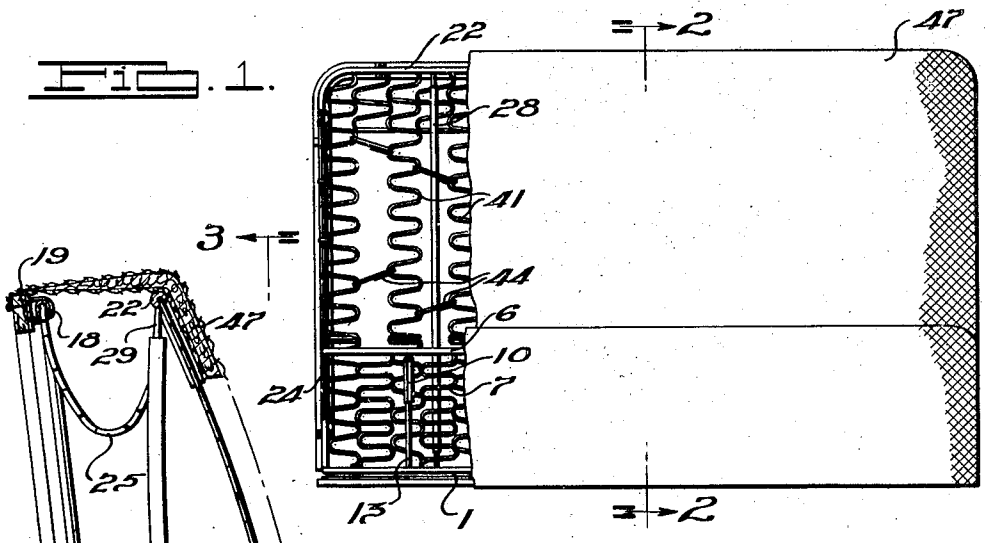
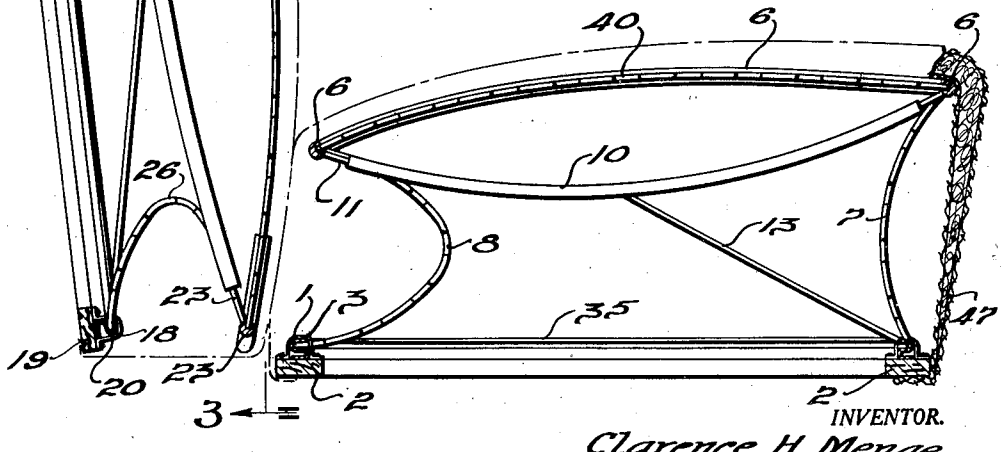


Fig. 2.



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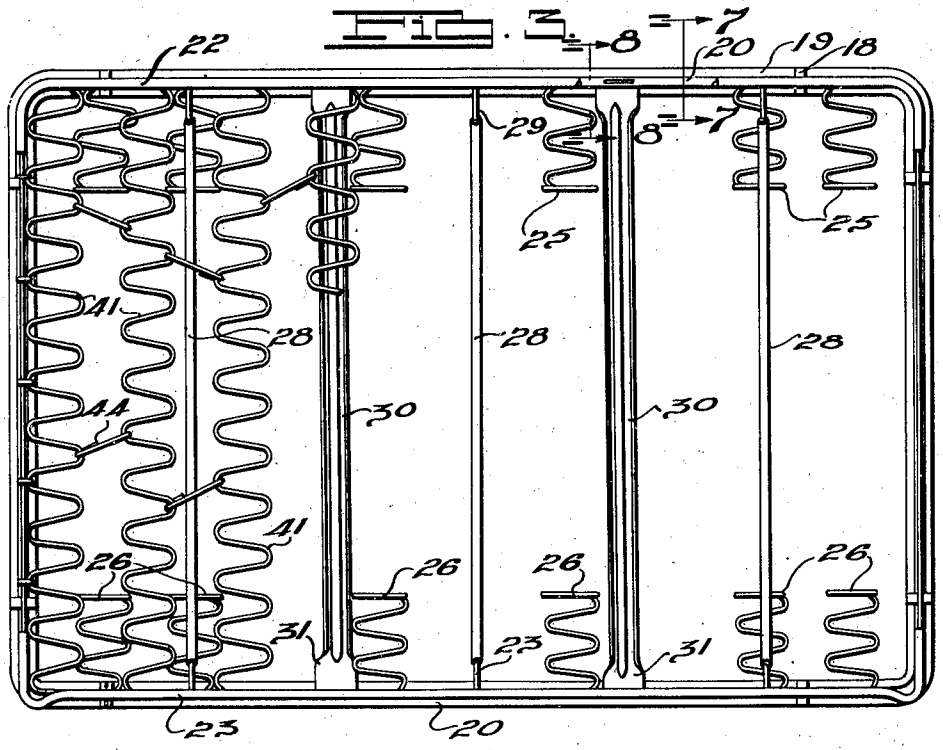
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Fig. 3.



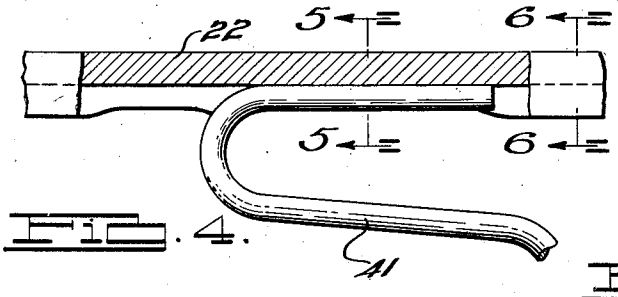


Fig. 4.

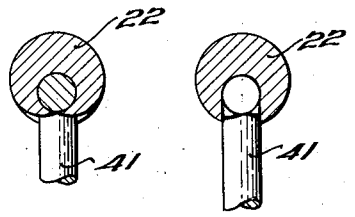


Fig. 5. Fig. 6.

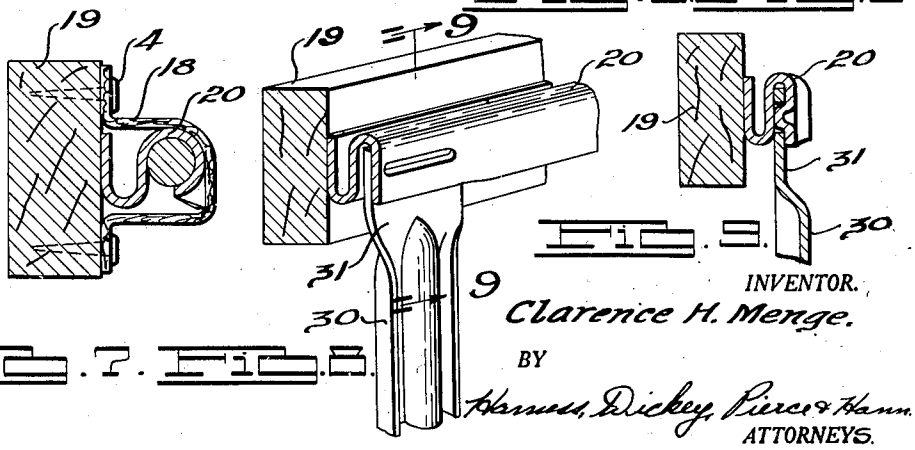


Fig. 7. Fig. 8. Fig. 9.

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UNITED STATES PATENT OFFICE

2,185,036

SEAT

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Application September 16, 1935, Serial No. 40,741

8 Claims. (Cl. 155—179)

This invention relates generally to seat construction. More particularly, it relates to that particular class of seat constructions which are adaptable for use in automobiles, wherein both a seat cushion and a seat back are provided and both are formed of relatively resilient construction.

This application is an improvement over applicant's prior co-pending application, Serial Number 23,587, filed May 27, 1935, which matured into Patent No. 2,106,644, issued January 27, 1938.

The present application, as was the case in the prior co-pending application referred to above, contemplates the utilization of spring elements of zig-zag or sinuous form such as are disclosed in the patent to Karl Kaden, No. 2,002,399, issued May 21, 1935.

The springs shown in the Kaden patent constitute a similar series of adjacent convolutions of spring wire, all of the portions of the said convolutions adapted to lie substantially in a single arcuate surface. Anchoring means are provided for the opposite ends of the spring members and it has been found that a marked degree of resilience is obtained due to the inherent resilience of the convolutions. Further, as has been brought out in the Kaden patent referred to above, a series of these spring elements arranged in substantially parallel relation and having their ends anchored, lie in arcs which are of greater radius than the normal arc of the spring element when in repose.

Applicant's prior co-pending application referred to above is directed primarily to a seat back construction in which a frame supporting the resilient elements is spaced from a seat back by means of additional spring elements or jack springs in order to materially increase the resilience of the structure as a whole.

One of the primary objects of the present invention is to provide a cushion structure in which spring elements of the sinuous type described above are used not only to give resilience to the surface structure of the cushion, but are also used for the purpose of spacing the surface portion of the cushion structure from the backing or mounting frame thereof.

Still further, the present invention contemplates utilization of novel means for anchoring the frame surrounding the surface portion of the seat to the mounting frame in order that the relative movement between these two members may be guided and controlled.

Still further, the present invention contemplates the provision of different spring constructions for various portions of the cushion structure in order that the respective resilience of said portions may be varied in accordance with the conditions to which they are subject.

A further object of the present invention resides in the provision of a relatively simple, strong and compact structure in which relative transverse movement between the surface and base portions of the cushion elements is prevented.

Yet another object of the present invention is to provide a seat cushion in which the top surface thereof has substantially uniform resilience throughout, this top surface portion being supported by a relatively rigid marginal frame. Means are provided for mounting this marginal frame with respect to a base frame in such a manner that the forward marginal edge of said frame will have a slightly greater resistance to movement toward the base frame than the rear portion thereof in order to provide the seat with a normal and natural resistance to the loads imposed thereon.

Many other objects and advantages of the invention will become apparent from the following specifications when taken in connection with the accompanying drawings.

In the drawings,

Figure 1 is a front elevation of the improved cushion and seat back with portions broken away to show the spring structure;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2, with portions broken away, showing the structure of the seat back;

Fig. 4 is an enlarged detailed view with parts broken away, showing the manner in which the ends of the spring elements are secured in the border rail;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4, showing the channel in the border rail;

Fig. 7 is an enlarged sectional view taken on the line 7—7 of Fig. 3;

Fig. 8 is an enlarged fragmentary perspective view of the base frame and the tacking strip associated therewith, showing the means by which the strengthening tie rods are secured to the base frame; and

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 8, showing the manner in which the ends of these tie rods are secured to the base frame.

With more particular reference to the drawings, the improved seat cushion comprises a base frame 1 formed of a sheet metal member of substantially S-shape cross section, which extends completely around the entire base of the cushion. This base frame 1 has a tacking strip 2 secured thereto by means of leather thongs passing around the base frame member 1 and secured to the tacking strip by means of tacks 4.

The S-shape cross section of the base frame member 1 provides an inwardly presenting channel entirely surrounding the base portion of the cushion and adapted to receive the various elements which serve to support the surface portion or auxiliary frame of the cushion. This base member 1 is also provided with an outwardly presenting channel which merely serves the purpose of strengthening the base frame and providing a more rigid structure.

An auxiliary cushion frame 6 is provided and adapted to be mounted in spaced relation with respect to the base frame 1. This auxiliary frame 6 comprises a continuous strip of border wire which is generally cylindrical in form and has a channel cut therein throughout its length. This channel provides an inwardly presenting recess throughout the entire length of the wire, and provides a channel extending completely around the cushion and opening inwardly toward the center thereof. The border wire member 6 constituting the upper or auxiliary frame of the cushion is resiliently mounted on the base frame at the front portion thereof by means of a plurality of spaced arcuate spring elements 7. These spring elements 7 are of the type described in the Kaden patent referred to above and comprise a series of similar lateral bends all lying in substantially the same surface. They are formed on arcs of relatively large radius and each has its last lateral convolution crimped into the channel of the base frame at its lower end and at its upper end; the last lateral convolution is crimped into the channel of the border wire 6 as shown in detail in Fig. 4. The rear marginal edge of the auxiliary frame 6 is connected to the base frame 1 by means of a similar spring element bent into arcuate or parabolic form on a curve of considerably less radius than the spring element 7 just described. It will be apparent that due to the smaller radius of the curve of the spring elements 8, the rearward portion of the cushion will have a considerably greater resilience than the forward portion thereof. This is desirable inasmuch as the major part of the load is usually carried on the rearward portion of the seat cushions.

The auxiliary frame 6 is strengthened at suitable points throughout its transverse width by means of bow members 10 formed from border wire similar to that used for the margin of the auxiliary frame 6 and having short pieces of wire 11 crimped in their ends and bent at an angle and crimped into the channel of the border wire. The tie rod or bow members 10 forming the braces for the auxiliary frame 6 have a downwardly presenting channel and at substantially the mid-point thereof have crimped in said channel a tie wire 13 which has its opposite end crimped into the channel of the base member 1. It will be readily seen that this structure prevents material transverse movement of the auxiliary frame 6 with respect to the base frame 1, yet does not interfere with a reasonable amount of relative vertical movement between these members.

The seat back is formed of substantially the same general construction as the seat cushion and is provided with a base member 20 and has a tacking strip generally designated as 19 secured thereto by means of leather thongs 18.

The auxiliary frame of the seat back comprises a pair of sections of border wire 22 and 23 constituting, respectively, the upper and lower marginal edges of the seat back. These border wire members 22 and 23 are spaced from one another by means of arcuately extending wires 24 which constitute the marginal end portion of the auxiliary frame and which wires have their ends crimped into the channel in the border members 22 and 23. It will be appreciated that this construction is slightly different from that disclosed in connection with the auxiliary frame of the seat cushion and it will be obvious that the seat back may be formed with a continuous section of border wire extending completely therearound; or the seat cushion may be formed of two separate sections of border wire interconnected by auxiliary wires as has been illustrated in connection with the seat back. Either of these forms may be used in either instance as may be found desirable.

The auxiliary frame of the seat back is resiliently connected to its base frame 20 by means of a plurality of upper and lower spring elements 25 and 26 similar in construction and shape to the elements 8 described in connection with the seat cushion and having their ends similarly secured in the channel of the border rail members of the auxiliary frame and the channel of the base frame.

Inasmuch as the loads generally imposed on the seat back are exerted in substantially the vertical central portion, the curvature of the supporting spring elements 25 and 26 is shown to be the same. However, it will be appreciated that the curvature of these spring elements may be varied to produce any desired degree of resilience.

The auxiliary frame of the seat back is strengthened by means of tie rod bows 28 spaced at suitable intervals and similar in construction to the tie rod bows 10 described in connection with the seat cushion. These tie rods 28 have short pieces of wire 29 firmly crimped in their ends and bent laterally and secured in the border rail members 22 and 23.

The base frame member 20 is strengthened by means of tie channels 30 spaced at suitable intervals throughout its transverse width. These channel members have their ends flattened as at 31 and slotted as is seen in Figs. 8 and 9, and have these ends firmly anchored in the channel of the spaced member 20 by means of crimping the metal of this channel tightly against the flat portion 31 of the end of the tie channel 30 and forcing some of the metal into the slot in this flattened portion.

The base portion 1 of the seat cushion is similarly strengthened by means of tie rods 35 interconnecting the forward and rearward margins of the base member 1 and secured in the channel thereof in substantially the same manner as has just been described.

The seat cushions and seat back are provided with resilient sub-surfaces formed of arcuate spring members 40 and 41 respectively. These members, as have been described in detail in applicant's prior co-pending application referred to above and are normally when in repose formed on arcs of considerably smaller radius than when in actual use. These members are spaced at

suitable transverse intervals across both the seat cushion and the seat back and have the last lateral convolution of each of the members securely crimped into the channel of the border rail element as is shown in detail in Figs. 4 to 6, inclusive. Links **44** are provided at suitable intervals connecting adjacent convolutions of the spring elements in order that their relative transverse position will be maintained without in any way impairing the individual resilience of each of the elements. Both the seat cushions and the seat backs may be covered as is conventional in the art. The conventional form of upholstery generally designated by the reference character **47** serves to cover the spring sub-surfaces carried by the auxiliary frames of these members and is carried around to the base frame and secured to a tacking strip carried thereby.

It will be seen that in the structure herein disclosed, a seat structure has been provided in which auxiliary frames are spaced and resiliently mounted upon a base frame.

It will be further seen that each of these auxiliary frames serves to provide the sole means for carrying spring elements which constitute the sub-surface of the seat and seat back portion. It will be further seen that substantially the same general type of spring element serves to provide a resilient means of interconnecting the auxiliary frame with the base frame thereof. Further, it will be apparent that by varying the degree which these resilient supporting elements are bent, inherent resilience of the mounting of the auxiliary frame of this cushion with respect to the base frame may be altered, as may be desired.

Many other and further objects of the invention will be obvious to those skilled in the art.

What is claimed is:

1. In a seat construction, a pair of spaced frames each having an inwardly presenting channel, sinuous spring elements having their terminal ends locked in the channel of one of said frames and arched to form a resilient subsurface for said seat, and spring elements each having one terminal end locked in the channel of one of said frame members and the other end locked in the channel of the other of said frame members whereby to provide a resilient interconnection between said frames.

2. A seat construction including in combination, a base frame and a cushion frame, both of said frames being substantially rectangular in configuration, springs interconnecting said frames and serving to maintain the same in resiliently spaced relation, said cushion frame having arcuate sinuous spring elements extending from side to side thereof, braces extending across said cushion frame arched in a direction opposite to the arc of said sinuous spring elements, and additional brace members extending from substantially the midpoints of said cushion frame to said base frame to preclude relative lateral movement between said frames.

3. A seat construction including in combination, a cushion frame comprising border wire elements forming the front and rear marginal edges thereof, arcuately disposed sinuous spring elements spanning said frame and having their ends locked in said border wire elements, said sinuous spring elements being arched upwardly from the plane of said border wire elements, border wire elements constituting ends for said frame interconnecting said first mentioned border wire elements at the ends thereof, and bracing elements spanning said first border elements and arcuately curved and arched in a direction opposite to said sinuous spring elements.

4. A seat construction including in combination, a cushion frame comprising border wire elements forming the front and rear marginal edges thereof, arcuately disposed sinuous spring elements spanning said frame and having their ends locked in said border wire elements, said sinuous spring elements being arched upwardly from the plane of said border wire elements, border wire elements constituting ends for said frame interconnecting said first mentioned border wire elements at the ends thereof, and bracing elements extending between said front and rear border wire elements intermediate their ends, said brace elements being arcuately curved and arched in a direction opposite to said sinuous spring elements.

5. A seat construction including in combination, a base frame and a cushion frame, said upper frame being of channel formation, flat zig-zag spring elements disposed on an arc of small radius having the ends extended and secured in the channel of said cushion frame, spring means supporting the top and bottom frame elements, and braces extending across the top frame element secured in the channels thereof for retaining the channels against transverse movement.

6. A seat frame embodying a rectangular shaped border element of channel section, flat zig-zag spring strips having a set on a small radius with the ends extended and secured in said channel and a brace extending across said border elements secured in the channel thereof to prevent transverse movement of said elements.

7. A seat frame embodying a rectangular shaped border element of channel section, flat zig-zag spring strips having a set on a small radius with the ends extended and secured in said channel and a brace extending across said border elements secured in the channel thereof, a base frame, and an additional brace interconnecting said first brace to said base frame.

8. A seat construction embodying an upper and a lower rectangular shaped border element of channel section, flat zig-zag spring strips spanning opposite sides of the upper border element and having the ends secured in the channel thereof, additional zig-zag spring strips supporting the upper border element on said lower border element with the ends of said strips secured in the respective channel portions thereof.

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